SOV/137-58-10-20721

Production of High-purity Magnesium and Alloys Based Thereon

crystals concreted into nodules. The yield of high-purity Mg is ~180 kg after 20 hours of sublimation. The sublimate is melted into bars in vacuum. The resultant Mg is of the following % composition: Fe 0.001-0.0025, Si 0.0002-0.0004, Cu + Ni 0.0001-0.0003, Al < 0.001. Owing to its low Fe contents it is considerably more corrosion resistant than electrolytic Mg.

Ye.Z.

1. Magnesium--Production 2. Magnesium alloys--Production 3. Electrolytes --Performance 4. Vacuum furnaces--Operation

Card 2/2

SOV/137-58-11-22218

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 54 (USSR)

AUTHORS: Strelets, Kh. L., Vasil'yev, Z. V., Gus'kov, V. M., Ivanov, A. I., Moiseyev, A. A., Farengol'ts, V. M.

TITLE: Development of an Electrolytic Method of Magnesium Recovery (Razrabotka elektroliticheskogo sposoba polucheniya magniya)

PERIODICAL: V sb.: Legkiye metally. Nr 4. Leningrad, 1957, pp 87-92

ABSTRACT: The history of the creation of Mg production in the USSR. The major efforts of the research and planning institutions and plants were directed toward improving the designs of the cells and speeding the Mg electrolysis process. In recent years, five-anode cells of both top and side anode-insertion designs, operating at 60,000 amps I, have been placed in operation. The working height of the anode has been increased from 80 to 100 cm. When the distance between poles is 8 cm, this does not result in any significant reduction in the current efficiency of Mg. These electrolysis procedures require 15 kwh/kg Mg when Mg chloride is subjected to electrolysis in a bath of optimal composition.

Card 1/1 I. G.

SOV/137-58-10-20702

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 52 (USSR)

AUTHOR: Gus'kov, V.M.

TITLE: Improving the Production of High-purity Aluminum (Sovershenstvovaniye proizvodstva alyuminiya vysokoy chistoty)

PERIODICAL: V sb.: Legkiye metally. Nr 4. Leningrad, 1957, pp 65-69

ABSTRACT: A brief description is offered of VAMI investigations in the field of electrolytic refining of Al. On the basis of these experiments, as well as of the work of a pilot-plant installation at the Volkhov Aluminum Plant, a department for the production of high-purity Al has been set up. Descriptions are offered of perfection of the process in the plant, and indices of the process, as well as the results of tests of a powerful I-41 kiloamps cell, showing that this cell operates more profitably than those now in use.

N.P.

1. Aluminum--Production 2. Aluminum--Processing

Card 1/1

SOV/137-58-12-24282

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 51 (USSR)

AUTHORS: Boldin, V. V., Gus'kov, V. M., Gupalo, I. P., Kil', I. G., Nikiforov, V. P.

TITLE: Development and Improvement of Electrolytic Aluminum Production in USSR Plants (Razvitiye i usovershenstvovaniye elektroliticheskogo polucheniya alyuminiya na zavodakh SSSR)

PERIODICAL: V sb.: Legkiye metally. Nr 4. Leningrad, 1957, pp 56-61

ABSTRACT: Design and experimentation toward development of a powerful 120-130,000 amp cell with top delivery of current is coming to a conclusion. In these baths the gas take-off is right over the crust of the electrolyte. This arrangement sharply reduces the amount of gas loss and increases the concentration of fluorine compounds in the gases. This makes regeneration of fluorine salts from them a real possibility. 1952-55 saw a jump in electrolysis engineering, and the major aluminum plants began to increase anode cd to 0.9-1.0 amps/cm^2 with simultaneous acidification of the baths to cryolite ratios ($NaF:AlF_3$) of 2.3-2.5, and reduction in the number of anode effects to 0.2-0.5 per bath per day. The Al level in the bath is held

Card 1/2

Development and Improvement of Electrolytic Aluminum Production in USSR Plants

at about 20 cm and the bath level at 20-25 cm. Cells now in operation are to gain 20% in output in the immediate future by increase in current intensity. This will require reduction in the distance between electrodes, introduction of special additives into the cells to increase electroconductivity or current efficiency, increase of anode width up to 300 mm, increase in anode-rod size and change in shape thereof, and increase in the cross section of cathode rods.

I. G.

Gus'kov, V. M.

L32b/L82c

Vacuum-melting apparatus for remelting of magnesium. ... Gus'kov, I. D. Tarasov ..., and S. M. ... U.S.S.R. 107,328, Sept. 15, 1957. An app. for obtaining ... Mg is described. M. Hosch

5.1310

TT618
307/80-33-1-27/47

AUTHORS: Yeremin, N. I., Gus'kov, V. M.

TITLE: Electrochemical Preparation of Gallium

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 157-163 (USSR)

ABSTRACT: Electrolytic preparation of gallium from synthetic aluminate-gallate solutions (of a low gallium content) was studied in order to find the best conditions of yield and recovery of gallium from such solutions. Deposition of gallium on the cathode in an alkali solution is contingent on the following reaction:

$$H_2GaO_3^- + H_2O + 3e \rightarrow Ga + 4OH^-$$

The electrolysis was conducted in a 500-ml beaker using steel plate (1Kh18N9T) electrodes (one cathode and two anodes). A small plastic crucible with a steel wire in its bottom was placed under the cathode (connected

Card 1/6

Electrochemical Preparation of Gallium

77518
SOV/80-33-1-27/49

Table 1. Kinetics of the electrolytic deposition of gallium. Conditions of electrolysis: temperature, 78°; $D_{cathode}$, 0.27 amp/cm^2; D_{anode}, 0.05 amp/cm^2; D_v = 19.2 amp/liter. Key to Table 1: (a) electrolyte composition (in g/liter); (b) Na_2O_{total}; (c) time (in hours); (d) recovery of Ga from the solution (in %).

(a)			(c)	(d)
Ga	Al_2O_3	(b)		
3.2	0	200	2	68.5
			4	91.8
			6	97.3
6.3	0	200	2	70.1
			4	91.4
			6	97.0
3.2	.69	200	2	69.0
			4	89.9
			6	96.5
6.3	69	200	2	71.8
			4	92.1
			6	97.0
6.3	130	200	2	72.0
			4	91.4
			6	95.6

Card 2/6

Electrochemical Preparation of Gallium

(illegible)
SOV/3-[illegible]-1-17/49

with the cathode) for the collection of the deposited (liquid) gallium. The effect of the solution alkalinity on the yield of Ga is shown in Fig. 2. The effect of SiO_2 content on the deposition of Ga is shown in Fig. 3. Effect of the temperature and current density on the Ga deposition were also studied. The following conclusions were made. Ga is deposited at more negative potentials than the potentials of Na deposition (by using Hg cathode) and hydrogen (using Ga cathode). The following optimum conditions of electrolytic Ga preparation from aluminate-gallate solutions of low Ga content are given: the concentration of Na_2O in the solution should be not less than equilibrium for the given content of Al_2O_3 in the electrolyte at a given temperature; more concentrated solutions (130-140 g/liter of Al_2O_3) with the same $Al_2O_3:Ga_2O_3$ ratio should be used; electrolyte temperature = 75-80°; $D_{cathode}$ = 0.2-0.23 amp/cm^2. There are 5 figures;

summary

Card 3/6

Electrochemical Preparation of Gallium

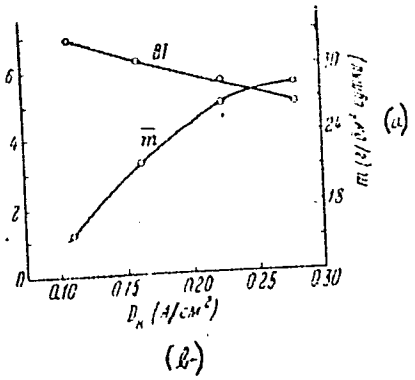
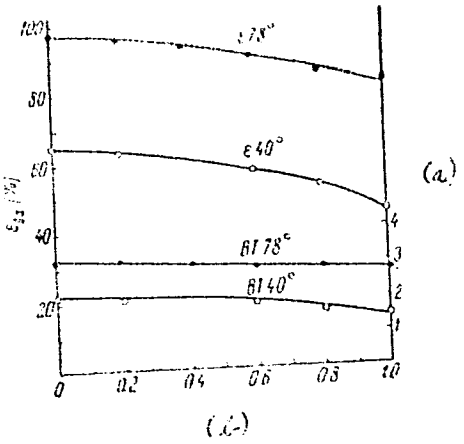


Fig. 2. Effect of the alkalinity of solution on the Ga deposition. Conditions of electrolysis: $D_{cathode}$ = = 0.27 amp/cm^2; D_{anode} = 0.06 amp/cm^2; D_v = 19.2 amp/liter; temperature, 78°; time, 6 hours; Ga content in the solution, 3.2 g/liter. Content of Al_2O_3 in the solution (in g/liter): (1) 69; (2) 120. Key to Fig. 2: (a) Yield based on current (in %); (b) Na_2O summary (g/liter).

Card 4/6

Fig. 3. Effect of SiO_2 content on the deposition of Ga. Conditions of deposition: $D_{cathode}$ = 0.27 amp/cm²; D_V = 19.2 amp/liter; time of electrolysis, 6 hours; composition of electrolyte (in g/liter): Al_2O_3, 69; Na_2O, 130; Ga, 3.2. Key to Fig. 3: (a) Yield based on current (in %); (b) SiO_2 (g/liter).



Card 5/6

Electrochemical Preparation of Gallium

77518
SOV/80-33-1-27/49

1 table; and 6 references, 1 U.S., 5 Soviet. The U.S. reference is: Recentry, Glerillan, Bent, J. Am. Chem. Soc., 56, 1662 (1934).

SUBMITTED: June 9, 1959

Card 6/6

GUS'KOV, V.M.

Electrolytic preparation of magnesium. Trudy VPI no.239:57-69 '64. (MIRA 17:10)

[illegible], Viktor Vasil'yevich; [illegible], Nikolay Vladimirovich; KISELEV, Vasiliy Pavlovich. Prinimal uchastiye M.ZLOV, V.A.; GUS'KOV, V.K., red.

[Metallurgy of titanium] Metallurgiia titana. Moskva, Izd-vo Metallurgiia, 1964. 207 p. (MIRA 17.7)

L 13534-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JW/JG

ACC NR: AP5028977 SOURCE CODE: UR/0149/65/000/004/0075/0077

AUTHOR: Galitskiy, N. V.; Gus'kov, V. M. (Deceased)

ORG: All-Union Scientific Research and Design Institute of the Aluminum, Magnesium and Electrode Industry (Vsesoyuznyy nauchno-issledovatel'skiy i proyektnyy institut Alyuminevoy, magniyevoy i elektrodnoy promyshlennosti)

TITLE: Study of the vapor pressure of chromic trichloride

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 4, 1965, 75-77

TOPIC TAGS: chromium compound, chlorine compound, vapor pressure, heat of sublimation

ABSTRACT: Döerner (U.S. Bureau of Mines, Techn. Papers, no. 577, 1937) had established that $CrCl_3$ in a chlorine atmosphere forms $CrCl_4$ stable above 700°C and decomposing at conventional temperature. Recent studies (S.A. Shchukarev, M. A. Oranskaya. Zh. organ. khimii, 24, v. 12, 2109 (1954)), however, do not completely tally with Döerner's findings. Particularly unusual is the close similarity of the heats of sublimation of $CrCl_3$ and $CrCl_2$. In this connection, the present authors investigated by the static method the pressure of saturated and unsaturated vapors of $CrCl_3$ in a soldered ampoule with a quartz-diaphragm manometer, over the 873-1303°K range. Findings: below 1065°K the curve of saturated vapor pressure changes from a straight to a slanted line; the inflection point of the curve closely coincides with the melting point of $CrCl_2$. At temperatures exceeding the dew point by 150-160° the pressure in the vessel

Card 1/2

UDC: 669.26

L 13534-66

ACC NR: AP5028977

deviates in the plus direction from that calculated according to the law of ideal gases. This fact, together with the bending of the curve of saturated vapor pressure, indicates that disproportionation of $CrCl_3$, namely:

$$2\,[CrCl_3]_r \rightleftarrows (CrCl_4)_r + [CrCl_2]_{cr}$$

takes place in the saturated vapor region, whereas the converse process of conproportionation takes place in the unsaturated vapor region. Orig. art. has: 3 formulas

SUB CODE: 07, 11/ SUBM DATE: 12Feb64/ ORIG REF: 002/ OTH REF: 006

Card 2/2

GUS'KOV, V.P., inzh.; RUZHINSKIY, M.B., inzh.; KUZ'MINSKIY, V.A.

Efficiency promotion and invention. Stroi. truboprov. 7 no.6:22 Je '62. (MIRA 15:7)

1. Stroitel'no-montazhnoye upravleniye No.6 tresta Nefteprovodmontazh, Chelyabinsk (for Gus'kov, Ruzhinskiy). 2. Proizvoditel' rabot stroitel'nogo uchastka No.14 Svarochno-montazhnogo tresta, g. Lyubertsy (for Kuz'minskiy).
(Pipelines--Buildings and structures)

GUS'KOV, V.S.

Strangulation and volvulus of the ileocecal flexure in a mesenteric opening. Khirurgiia Supplement:37 '57. (MIRA 11:4)

1. Iz Pektubayevskoy rayonnoy bol'nitsy Mariyskoy ASSR.
(MESENTERY--ABNORMITIES AND DEFORMITIES)
(INTESTINES--OBSTRUCTION)

G'S'KOV, V.S., Cand Med Sci -- (diss) "Dynamics of oxidation of ethyl alcohol in schizophrenia." Voronezh, 1959. 17 pp (Voronezh State Med Inst). 200 copies (KL,39-59, 107)

GUS'KOV, V.S.

Characteristics of alcohol oxidation in schizophrenia. Trudy Gos. nauch.-issl.inst.psikh. 27:138-146 '61. (MIRA 15:10)

1. Ivanovskiy meditsinskiy institut. Dir. - dotsent Ya.M.Romanov. Kafedra psikhiatrii. Nauchnyy rukovoditel' - prof. G.I.Plesso.
(SCHIZOPHRENIA) (ALCOHOL--PHYSIOLOGICAL EFFECT)

SHEGTAKOV, B.I.; GUS'KOV, V.S.

Conditioned phagocytic and oculocardiac reflex in schizophrenics. Trudy Vor. med. inst. 51:177-181 '63. (MIRA 18:10)

1. Kafedra psikhiatrii Voronezhskogo meditsinskogo instituta.

GUS'KOV, V.S.

Conditioned phagocytic reflex in schizophrenia. Trudy Ver. med. inst. 51:225-229 '63. (MIRA 18:10)

1. Kafedra psikhiatrii Voronezhskogo meditsinskogo instituta.

GUS'KOV, Viktor Stepanovich; FEDOTOV, D.D., otv. red.; PLESSO, G.I., red.

[Psychiatrist's terminological dictionary] Terminologicheskii slovar' psikhiatra. Pod red. G.I.Plesso. Moskva, Meditsina, 1965. 219 p. (MIRA 19:1)

AID P - 4307

Subject : USSR/Engineering

Card 1/1 Pub. 128 - 7/26

Author : Gus'kov, V. V., Engineer

Title : New trailing tractor

Periodical : Vest. mash., #3, p. 29-30, Mr 1956

Abstract : A new TDT-40 tractor is described for hauling logs. Photo.

Institution : None

Submitted : No date

GUSIKOV, V.V., inzh.

Resistance to the motion of truck-laying machines on peat oils.
Torf.prom. 36 no.8:24-26 '59. (MIRA 13:3)

1. Akademiya sel'skokhozyaystvennykh nauk BSSR.
(Peat machinery)

GUS'KOV, V. V., Cand Tech Sci (diss) -- "Investigation of the traction-coupling qualities of a caterpillar-type tractor on peat-bog soil". Minsk, 1960. 17 pp (Min Higher, Inter, Spec, and Professional Educ Beloruss SSR, Beloruss Polytech Inst im I. V. Stalin), 170 copies (KL, No 10, 1960, 130)

GUS'KOV, V.V., kand.tekhn.nauk

Problems in selecting optimal parameters for prospective crawler tractors. Trakt. i sel'khozmash. 33 no.8:5-8 Ag '63. (MIRA 16:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva nechernozemnoy zony SSSR.

GUS'KOV, V.V., kand. tekhn. nauk; KUZ'MENKO, V.A., inzh.;
BADALOV, M.M., inzh.

Selecting optimal parameters for wheeled tractors. Trakt.
i sel'khozmash. 33 no.10:1-4 O '63. (MIRA 17:1)

1. TSentral'nyy nauchno-issledovatel'skiy institut
mekhanizatsii i elektrifikatsii sel'skogo khozyaystva
nechernozemnoy zony SSSR.

GUS'KOV, V.V.; [illegible], S.A.

Introducing an automatic unit for the distribution of mold sand. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 18 no.5:20-22 My '65. (MIRA 18:6)

SELETSKIY, M.A.; METREVELI, L.I.; GUS'KOV, Ye.S.

Automatic machine for marking and packing ampules in boxes. Med.prom. 13 no.11:23-26 N '59. (MIRA 13:3)

1. Moskovskiy nauchno-issledovatel'skiy institut preparatov protiv poliomiyelita.
(PACKAGING) (DRUG INDUSTRY)

STEPANOV, A. O.; STAKHANOV, I. P.; GUS'KOV, Yu. K.; KAZIKOV, I. I.; PAVLENKO, V. P.; MAYEV, S. A.; LEBEDEV, M. A.

"State of the investigations into physical processes in thermionic converters."

report to be presented at Intl Conf on Thermionic Electrical Power Generation, London, 20-24 Sep 65.

USSR State Comm for Applications of Atomic Energy, Moscow.

BEKMUKHAMBETOV, Ye.S.; GUS'KOV, Yu.K.; LEBEDEV, S.Ya.

Effect of krypton on the performance of a thermionic converter. Zhur. tekh. fiz. 35 no.9:1707-1709 S '65.

Performance of a cesium thermionic converter in the presence of xenon. Ibid.:1709-1711 S '65. (MIRA 18:10)

L 2089-66 EWT(l)/EPA(s)-2/EWT(m)/EPF(c)/EEC(k)-2/ETC/EWG(m)/EPA(w)-2/T/EWP(t)/EWP(b)/ENA(h) IJP(c) TT/JD/WW/AT

ACCESSION NR: AP5024057 UR/0057/65/035/009/1709/1711

AUTHOR: Bekmukhambetov, Ye. S.; Gus'kov, Yu. K.; Lebedev, S. Ya.

TITLE: The operation of a cesium thermionic converter in the presence of xenon

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1709-1711

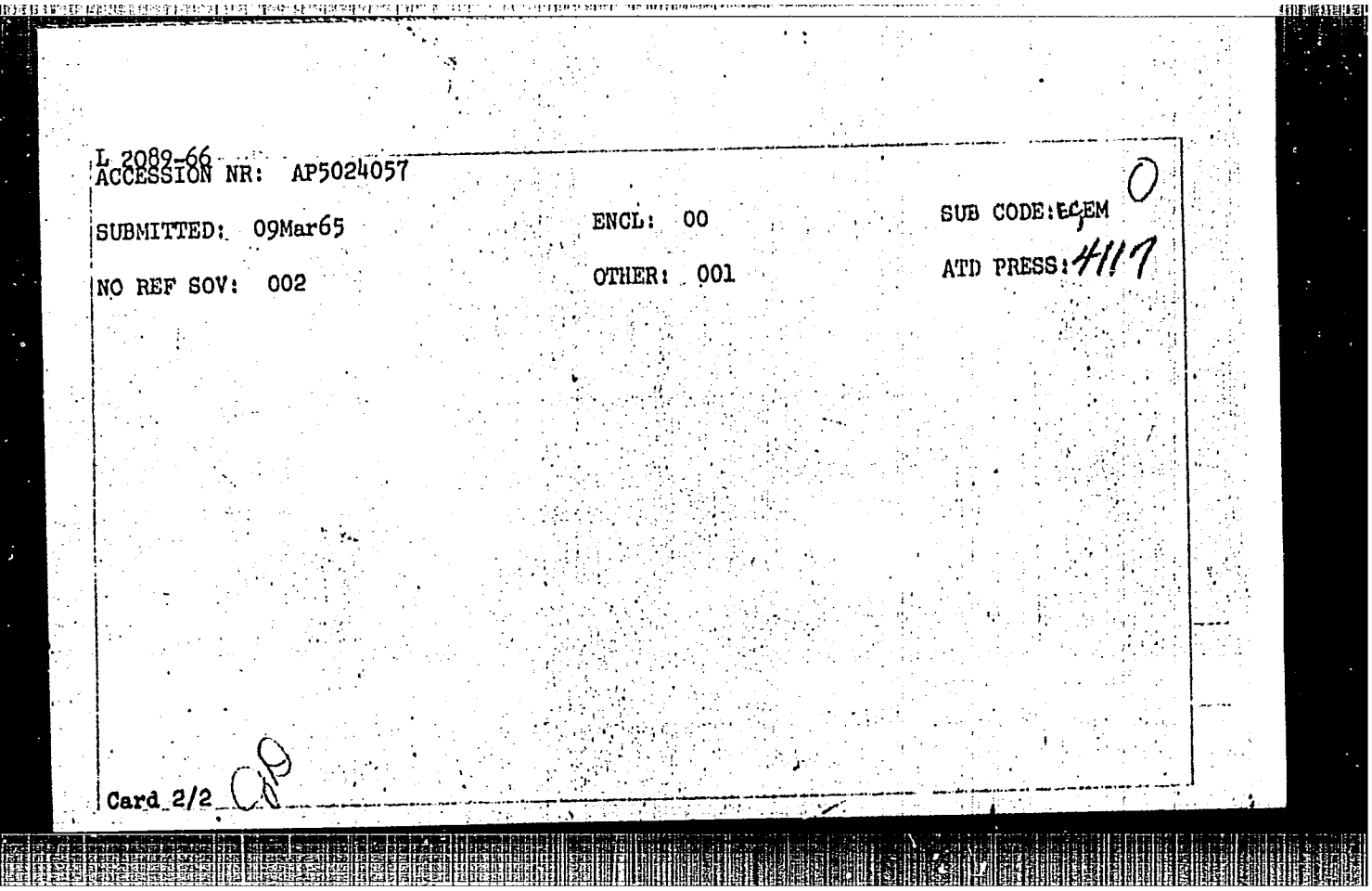
TOPIC TAGS: cesium thermionic converter, thermionic converter, cesium, xenon

ABSTRACT: The temperature dependence of short-circuit currents of a thermionic converter was measured, first in pure cesium atmospheres in the range of pressures from 2.75×10^{-2}—2 mm Hg, and then with admixtures of xenon at pressures ranging from 0.27—69 mm Hg. Generally, the experiments showed a parallel shift of the curves toward smaller currents. However, at a xenon pressure of 69 mm Hg a change in the curve's angle was observed. The lack of a plateau in the volt-ampere characteristics is explained by volume recombination. When at cesium pressure of about 2 mm Hg the cathode temperature reaches 1300K, a small admixture of xenon at 0.27 mm Hg brings about an increase of the current and voltage of the converter due to its passing to the arc mode. A further increase of xenon pressure reduces the converter's output. Orig. art. has: 1 formula and 4 figures.

ASSOCIATION: none [ZL]

Card 1/2

Card 2/2



L 2089-66
ACCESSION NR: AP5024057

SUBMITTED: 09Mar65 ENCL: 00 SUB CODE: EC, EM

NO REF SOV: 002 OTHER: 001 ATD PRESS: 4117

Card 2/2

66375

21,1800, 21,5300 SOV/120-59-5-28/46

AUTHORS: Gus'kov, Yu.K. and Zvonarev, A.V.

TITLE: A Thermocouple System for the Measurement of Large Neutron Fluxes

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 121 - 122 (USSR)

ABSTRACT: In nuclear-reactor experiments, it is useful to have a simple neutron detector which may be used to measure, rapidly and in a wide range, neutron fluxes in the presence of large γ-ray background. A simple thermocouple system is described in the present paper and is shown in Figure 1. The detector consists of two thermocouples made up of chromel and copper-nickel (56% Cu, 43% Ni) junctions. The detector is shown schematically in Figure 1, in which 1 is an aluminium frame, 2 is an aluminium disc which centres the detector in the reactor channel, 3 is an insulator, 4 are the free ends of the thermocouples, 6 is a steeltube with U_3O_8 enriched (75%) with U^{235}, 7 is a steel tube filled with Pb_3O_4, 8 is the common end of the thermocouples (the Cu-Ni alloy).

Card1/3

A Thermocouple System for the Measurement of Large Neutron Fluxes

The amount of U_3O_8 and Pb_3O_4 in the two tubes is about the same. Figure 2 shows the calibration curve for the detector in which the neutron flux is plotted horizontally and the output of the thermocouple in mV, vertically. As can be seen from Figure 1, the thermocouples are connected in opposition so that the e.m.f. measured across the free chromel ends is equal to the difference in the thermal e.m.f. of the two thermocouples. The measured thermal e.m.f. difference is a measure of the heating due to the fission of U^{235}. The heating of the thermocouple due to the housing medium and γ-rays is automatically compensated. The instrument has been tested in an experimental cooled channel of an atomic power station, using fluxes between 5×10^9 and 1.5×10^{13} neutron/cm^2 sec. One of the disadvantages of the instrument is that it is not linear for large neutron fluxes. The settling time of the system is about 5 - 10 min.

4

66375

SOV/120-59-5-28/46

A Thermocouple System for the Measurement of Large Neutron Fluxes

There are 2 figures and 4 references, 1 of which is Soviet, 1 Swedish and 2 English.

SUBMITTED: September 4, 1958

4

Card 3/3

21(4), 15(2)

AUTHORS: Gus'kov, Yu. K., Sachkov, V. F. SOV/89-6-2-14/28

TITLE: Irradiation Effect on Insulators (Vliyaniye obluchcniya na izolyatory)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 2, pp 2o4 - 2o5 (USSR)

ABSTRACT: Porcelain, glimmer and quartz were irradiated in a cooled channel at the Soviet Atomic Power Station. The medium neutron flux in the channel amounted to $0.8.10^{13}$n/cm^2 sec. at a cadmium ratio (with respect to gold) of 1.5. Serious difficulties arise in the measurement of high resistances during the irradiation of the samples. There is a considerable energy loss due to air ionization in the irradiation channel. Therefore it is necessary to shield them very carefully during the insulator resistance measurement. Furthermore a photoelectric EMN occurs in the supply lines and at the contact points of the insulator and the measuring electrode during irradiation. It was found by experiments that the EMN practically does not depend on the duration of irradiation; it depends, however, considerably on the neutron and γ-flux. For the elimination of the EMN effect it is necessary to measure the volt-ampere characteristics

Card 1/3

in any individual case. The EMU-3 electrometer amplifier was used for the resistance measurement; it has a strong inlet resistance ($9.10^{11}\Omega$). The battery voltage was checked by means of the S-95 voltmeter. The volt-ampere characteristics were plotted within the range of 0 - 2000 v, and the resistance of the samples was determined accordingly. The disk-like test samples had a diameter of 20 mm. The quartz and porcelain disks were 1.5 mm thick, the glimmer disks, however, only 0.05 mm. The contact points of the insulator and the measuring electrodes were improved by a "Akvadag" cover or silver layers pulverized in vacuum. The test samples were clammed between two Teflon disks and held together by brass contacts. The whole measuring head was then introduced into a brass shell and put into an aluminum container which had been introduced into the irradiation channel. The sample temperature was controlled at the contact points by a thermocouple (copper-constantan). During the experiment quartz and glimmer did never exceed a temperature of more than 160°C. Porcelain attained a maximum temperature of 130° C. A line of the BPTE type with a gauge of 0.5 mm was used as a measuring line.

Irradiation Effect on Insulators

SOV/89-6-2-14/28

The results of the resistance measurement are given in a graph. The sample resistance decreases in the first moment of irradiation to $10^{13}\ \Omega$.cm with glimmer, to $3.5.10^{13}\ \Omega$.cm with porcelain and to $10^{10}\ \Omega$.cm with quartz. On an increase of the integral irradiation dose there is a linear increase in the resistance of quartz and glimmer, and a change of the integral irradiation dose by one order results in an increase of the quartz resistance also by one order. With glimmer the increase amounts only to 50%. It may be concluded from the results obtained that quartz, porcelain and glimmer maintain their insulating properties in irradiation with a neutron flux of $\sim 10^{13} n/cm^2$ sec. and a total flux of $\sim 5.10^{18}\ n/cm^2$. This subject was suggested by Professor A. K. Krasin. A. V. Zvonarev assisted in the experiment. There are 3 figures and 8 references, 3 of which are Soviet.

SUBMITTED: October 8, 1958

Card 3/3

SOV/89-7-2-13/24

24(0) 21(4)

AUTHORS: Gus'kov, Yu. K., Zvonarev, A. V.

TITLE: Measuring the Electrical Resistivity of Boiling Nitrogen Under Irradiation in a Reactor (Izmereniye elektricheskogo soprotivleniya kipyashchego azota pri obluchenii yego v reaktore)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 2, pp 165 - 166 (USSR)

ABSTRACT: The measuring instrument consists of a Dewar flask with two 2.4 cm^2 copper plates (there is an outline sketch) to which wires of the BPTE wire are soldered. The metallic shielding of the cable reaches to the electrodes up to 10 mm. The electrodes are 5 mm apart. The Dewar flask is filled with 118 g of liquid nitrogen. The resistance was measured with the TO-1 instrument (measuring range 10^6 to $10^{12}\ \Omega$). The resistance between the two BPTE cables at a neutron flux of $1.5.10^{13} n/cm^2.sec$ is more than $10^{10}\ \Omega/m$. The electrical resistance of liquid nitrogen was $\sim 10^{12}\ \Omega/cm^3$ at a neutron flux of $10^{11}/cm^2.sec$ and $4.10^9\ \Omega/cm^3$ at a flux of $1.5.10^{13}\ n/cm^3.sec$. When sufficient liquid evapo-

Card 1/2

rated to leave the electrodes free the resistance decreased to $7.10^7 \Omega/cm^3$. During irradiation in the reactor the nitrogen boiled very strongly and the evaporation time decreased by one order of magnitude. A. K. Krasin, Doctor of Physical-mathematical Sciences, took an interest in this work. A. G. Vishnyak cooperated in the experiments. There is 1 figure.

SUBMITTED: April 18, 1959

69094
S/120/60/000/01/047/051
E032/E314

21.3000

AUTHORS: Gus'kov, Yu.K., Zvonarev, A.V. and Klychkova, V.P.

TITLE: Preparation of Uranium Layers by Evaporation in Vacuo

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 1, pp 143 - 144 (USSR)

ABSTRACT: In nuclear physics it is frequently necessary to use specimens having a uranium layer deposited on them. The present authors have developed an evaporator which will work for 50 hours and can produce layers of U_3O_8 30 - 40 μ thick in a single evaporation. Various types of evaporators were tried, most of which did not have a sufficiently long working life. The most successful was that shown schematically in Figure 1. The evaporator consists of two concentric and cylindrical tungsten spirals made of a wire 1 mm in diameter. The spirals end in a cone, as shown and are surrounded by a tantalum screen (3). 4 - 5 g of U_3O_8 could be placed in the evaporator and the rate of evaporation was 10 g/h. The corresponding rate of growth of the U_3O_8 layer was

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E/032/E314

Preparation of Uranium Layers by Evaporation in Vacuo

This is an abridged translation.
There are 1 figure and 4 references, 3 of which are Soviet and 1 is English.

SUBMITTED: December 27, 1958

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Preparation of Uranium Layers by Evaporation in Vacuo

1 - 1.5 mg/min. The power required was about 1 kW. The evaporation was carried out in a vacuum of 10^{-4} to 10^{-5} mm Hg and provision was made for replacing the U_3O_8 in the spiral without opening up the vacuum chamber. In this way 50 - 80 μ thick layers of U_3O_8 could be obtained without difficulty. The uniformity of the deposit was controlled by measuring the β-activity at various points on the specimen (Damodaran, Ref 1). In Figure 1 the notation is as follows: 1) tungsten plate, 5 mm thick; 2) lower screening plate made of tantalum, 0.1 mm thick; 3) tantalum screen, 0.1 mm thick; 4) outer tungsten spiral; 5) tantalum support for the outer spiral, 01 mm thick; 6) inner tungsten spiral; 7) tantalum cover 0.5 mm thick supporting the inner spiral; 8) nickel screen, 0.5 mm thick; 9) mica; 10) porcelain tube; 11) nickel disc, 5 mm thick and containing an insert for the specimen; 12) tungsten nut; 13) tungsten rod.

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21.1000,24.6820

77227
SOV/89-8-1-21/29

AUTHORS: Gus'kov, Yu. K., Zvonarev, A. V., Klychkova, V. P.

TITLE: A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 1, pp 72-75 (USSR)

ABSTRACT: It is known on the basis of light, X-ray, γ-ray, β- and α-particle irradiation of hole-electron semiconductor systems that an electromotive force can be generated. The authors investigated the effects of fission particles originating in one member of the system chosen to be a uranium semiconductor compound. One had to be careful to choose a material which will not change appreciably its electrical properties. Semiconductors with a large number of original lattice defects satisfy such a requirement, and, having the choice between the polycrystalline semiconductors and monocrystals with appreciable amount of impurities, the authors preferred the polycrystalline oxide

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A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

semiconductors. In all experiments U_3O_8 served as the hole semiconductor with a high work function, and for low work function electron semiconductor the authors utilized BaO, TiO_2, MgO, and Al_2O_3. Gold and cooper were electrodes for U_3O_8, magnesium, and titan for the electron semiconductor. U_3O_8-BaO and U_3O_8-TiO_2 samples were obtained by thermal vacuum evaporation of semiconductor and electrode layers. In the case of U_3O_8-Al_2O_3, a layer of Al_2O_3 was sprayed on a titanium base, and then U_3O_8 was evaporated in vacuum, followed by gold or cooper. This did not work for MgO, so a ceramic layer of MgO, 0.5-mm thick was taken on which a magnesium electrode on one side, and U_3O_8 with gold or cooper on the other side was sprayed. Working surfaces were 6

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and 2.8 cm^2, and thickness of U_3O_8, BaO, TiO_2 was 5 to 20 μ and that of A_2O_3 was 100 to 200 μ . Samples were held between bronze holders, with cooper-constantan thermocouple on one of them for temperature determination. Finally, the whole combination was enclosed in aluminum containers and irradiated in the experimentally cooled channel of the atomic reactor, with a density of neutrons and γ-rays between 10^{10} to 10^{13} $cm^{-2} \cdot sec^{-1}$ (depending on its power level). Sample temperature was approximately 120° C. The authors investigated the emf V_∞, short-circuit current I_{sc}, load characteristic, surface temperature of the samples, and their resistance R at a potential difference of 1.4 v direct and in reverse. Volt-ampere characteristics were taken before and after exposure. All samples showed presence of an emf. Figure 1 represents the case of U_3O_8-MgO.

A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

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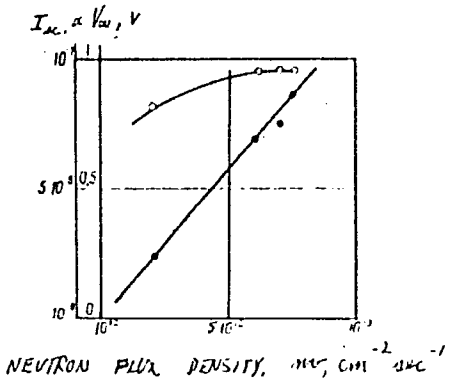

Fig. 1. Emf V_{oo} (o) and current I_{cs} (●) vs neutron flux density nv for an U_3O_8-MgO sample.

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A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

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On Fig. 2 is shown the load characteristic, similar to that of a valve photoelement. Neutron flux density was equal to $8 \cdot 10^{12}$ $cm^{-2} \cdot sec^{-1}$. Figure 3 represents typical volt-ampere characteristics of an U_3O_8-Al_2O_3 sample, before and after exposure. A small valve effect is observable after exposure; during irradiation the rectifying coefficient at 1.4 v was between 2 and 10. Figure 4 shows large variations of all characteristics. Special experiments were performed to check the role of the uranium fission fragments in the emf generation process. Same samples irradiated with γ-rays showed three times weaker effect than in the case of neutron irradiation. This compares favorable with the relative ionization of γ-rays and neutrons. One double sample of U_3O_8-Al_2O_3 was prepared, utilizing on one side a uranium sample 10% enriched in U^{235} while on the other, natural U_3O_8 was used. The

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A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

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SOV/89-8-1-21/29

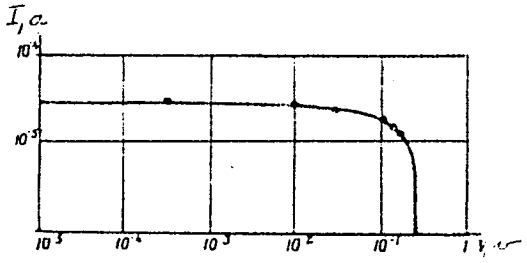

Fig. 2. Load characteristics of an U_3O_8-MgO sample.

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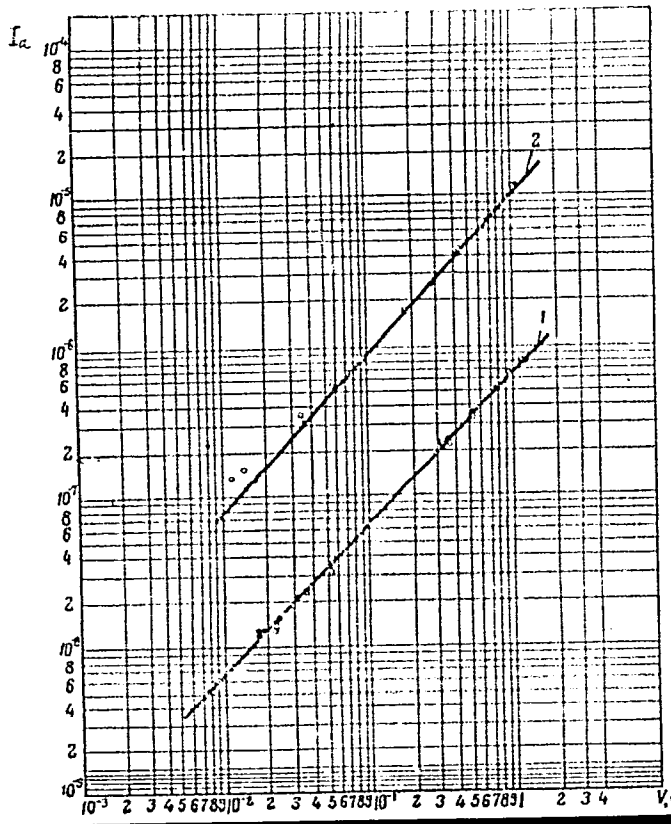

77227, SOV/89-8-1-21/29

Fig. 3. Volt-ampere characteristics of the U_3O_8-Al_2O_3 sample before (curve 1) and after (curve 2) exposure in reactor: •, negative potential on the titanium electrode; o, positive potential on the titanium electrode.

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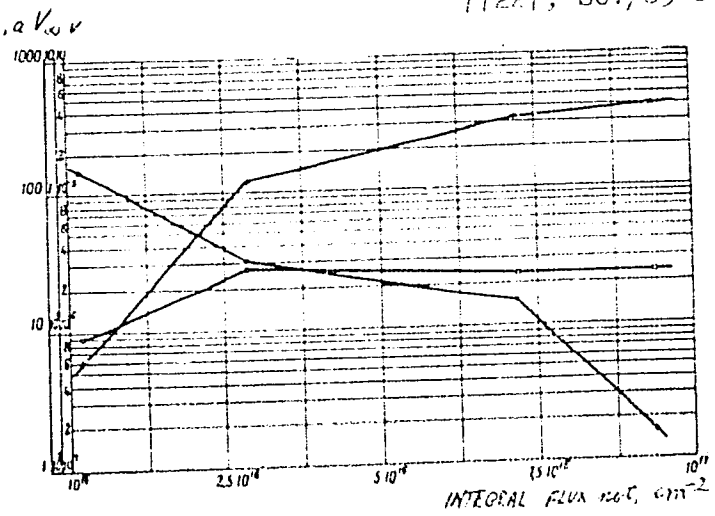

Fig. 4. I_{cs} (x), V_∞ (o) and R (•) of an U_3O_8-MgO sample vs integral neutron flux nvt at a constant neutron flux density of $8 \cdot 10^{12}$ $cm^{-2} \cdot sec^{-1}$.

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A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

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SOV/89-8-1-21/29

10% enriched sample gave a 1½ times larger effect than the natural one. Authors used also oxides and sulfides of Be, Ni, Mo, W, Zn, and Co. In all cases they observed an emf, although the biggest effect occurred with the U_3O_8-MgO combination. Computation showed that in this last case 0.01% of the fragments' energy was transformed into electrical energy. Such small efficiency can be explained through the apparently short lifetime of the current carriers, and a poor relation between their diffusion path length compared with the sample thickness. The authors conclude that the emf is basically a result of a valve effect, although the volume and thermal emf may play some role too. Professor A. K. Krasin showed interest, G. N. Ushakov collaborated during experiments, and R. G. Bulycheva, V. A. Shalin, and G. V. Rykov were partially involved in experimental work. There are 4 figures; and 6 references, 4 Soviet, 1 U.K., 1 U.S. The U.K. and

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A Study of Electromotive Forces Generated in Semiconductor Systems Containing Uranium, When Irradiated in Reactors. Letter to the Editor

77227
SOV/89-8-1-21/29

U.S. references are: G. Kinchin, R. Pease, Repts Progr. Phys., 18, 1 (1955); J. Glen, Advances Phys., 4, Nr 16, 381 (1955).

SUBMITTED: August 3, 1959

Card 10/10

LEBEDEV, M.A.; GUS'KOV, Yu.K.

Electric breakdown in cesium vapor. Zhur. tekh. fiz. 33 no.12: 1462-1463 D '63. (MIRA 16:12)

L 14036-65 EWT(l)/EWP(e)/EPA(s)-2/EWG(k)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/
EPA(bb)-2/EWP(b)/EWA(h)/FS(b) Pz-6/Pf-4/Pr-4/Pi-10/Peb/Pk-4 EJP(c)/ASD(m)-3/ESD/
ACCESSION NR: AP4045315 SSD(b)/ASD(d)/AFETR/AS(mp)-2/ S/0048/64/028/009/1530/1533
ASD(a)-5/AEDC(a)/AFWL/ESD(gs)/ESD(t) JRB/JD/TT/WW/AT

AUTHOR: Gus'kov, Yu. K.; Lebedev, M. A.; Stakhanov, I. P.

TITLE: Effect of a longitudinal magnetic field on a low-voltage arc (in cesium vapor) [Report, Tenth Conference on Cathode Electronics held in Kiev from 11 to 18 Nov 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 9, 1964, 1530-1533

TOPIC TAGS: electric arc, cesium, thermionic converter

ABSTRACT: In high-power thermionic converters, the heavy current may induce a transverse magnetic field which can significantly reduce the output power. It has been suggested (A. Schock, J. Appl. Phys. 31, 1978, 1960) that a longitudinal magnetic field might be applied to the converter to compensate for the transverse field. However, there are no reports in the literature on any experimental studies of the effect of a longitudinal field on the parameters of arc-type converters. The present paper gives the results of investigation of the effect of a longitudinal field H on a low-voltage arc in cesium vapor. A diagram of the thermostated, solenoid-jacketed arc chamber used in the experiments is given in the text. Longitudinal fields from zero to 430 oe were applied. A set of curves showing the

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L 14036-65
ACCESSION NR: AP4045315

variation of the discharge current at different Cs vapor pressures with H is presented; these were obtained at a cathode temperature of 800C and an anode temperature of 350C. At low vapor pressures (5×10^{-4} mm Hg) the current first increases with H, goes through a maximum, then falls off; at higher pressures (5×10^{-2} to 1.0 mm Hg) no initial rise is evidenced, instead, the current decreases linearly with H. Other figures show the variation of I with H at different cathode temperatures at $p = 5 \times 10^{-4}$ mm Hg, and the variation of I_H/I_0 (I_0 is the zero field value of the current) and of the relative arc potential with H (both the last two are characterized by almost straight lines with negative slope). An interpretation of the observed effects is proposed. It would appear that, in general, the effect of a longitudinal magnetic field is not favorable. "The authors are grateful to the late Prof. I. I. Bondarenko for his constant interest in the work and useful discussions." Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: EC, EM

NO REF SOV: 001 OTHER: 002

Card 2/2

L 4372-65 EWT(1)/EPA(s)-2/EWG(k)/EWT(m)/EPA(sp)-2/EPF(c)/EEC(k)-2/EPF(n)-2/EPA(w)-2/T/EPA(bb)-2/EWA/EWP(b)/EWA(h)/FS(b) Pz-6/Pab-10/Pr-4/Pt-10/Peb/Pu-4/Pk-4 IJP(c)/AFWL/SSD(b)/ASD(a)-5/ASD(f)-2/SSD/ASD(m)-3/AS(mp)-2/ESD(gs)/S/0048/64/028/009/1537/1540

ACCESSION NR: AP4045317 ESD(t) JHB/JD/TT/WW/JG/AT

AUTHOR: Gus'kov, Yu. K.; Pashchenko, V. P.; Sibir, Ye. Ye.

TITLE: Investigation of the operation of a thermionic converter with different metal film cathodes [Report, Tenth Conference on Cathode Electronics held in Kiev from 11 to 18 Nov 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 9, 1964, 1537-1540

TOPIC TAGS: thermionic converter, rectifier, cesium, tungsten, molybdenum, niobium, rhenium

ABSTRACT: This paper gives the results of investigation of a thermionic converter with a Nb, Mo, W, or Re cathode operated in diffusion and arc modes. The measurements were carried out in glass tubes with rectangular electrodes. The cathodes were in the form of 0.05 to 0.1 mm thick, 5 x 12 mm ribbons and were mounted, by means of tantalum tension wires, 0.7 mm from the massive, finned anode. The tube was filled with cesium vapor at pressures from 0.1 to 10 mm Hg. The experimental results are presented in the form of curves: $I \sqrt{P}$ (P is the

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ACCESSION NR: AP4045317

Cs vapor pressure) versus 1/T, I versus V, W versus V, W versus T, and I versus T (T is the cathode temperature). It was found that: 1) in the volume ionization mode, the converter short-circuit current increases with the work function of the cathode material and the Cs vapor pressure; 2) in this mode, the converter current is only weakly dependent on the cathode temperature; 3) the converter voltage at peak power increases with increase of the cathode temperature and with decrease of the cathode work function; 4) in both the volume ionization and low-voltage arc mode, some temperature and voltage hysteresis loops are evidenced (that is, the current depends on the manner of variation in the parameters V and T); 5) a transition to the volume ionization mode can be realized by either a change in the cathode temperature or application of an external voltage. For operation in the volume ionization mode, which is generally more efficient, cathodes with a high work function are preferred. "The author is grateful to the late Prof. I. I. Bondarenko for useful discussions and interest in the work." Orig. art. has: 2 formulas, 6 figures, and 1 table.

ASSOCIATION: none

Card 2/3

L 14372-65
ACCESSION NR: AP4045317

ENCL: 00

SUBMITTED: 00

SUB CODE: EC, MM NO REF SOV: 005 OTHER: 001

Card 3/3

L 12044-65 EWT(l)/EPA(s)-2/EWG(k)/EWT(m)/EPA(sp)-2/EPF(n)-2/EPA(w)-2/T/EWP(t)/
EWA/EWP(b) Pz-6/Pab-10/Pt-10/Pu-4 IJP(c)/SSD/ASD(m)-3/AFWL/ASD(f)-2/ESD(gs)/
ACCESSION NR: AP4045319 ESD(t)/SSD(b) JD/WW/JG/AT S/0048/64/028/009/1545/1547

AUTHOR: Bondarenko, V.K.; Gus'ko, Yu.K.; Pashchenko, V.P.

TITLE: Determination of the thermoelectronic emission constants of metal film cathodes of converters /Report, Tenth Conference on Cathode Electronics held in Kiev, 11-18 Nov 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.9, 1964, 1545-1547

TOPIC TAGS: thermoelectric converter, cesium vapor diode, work function, thermionic emission, molybdenum, niobium

ABSTRACT: Two procedures for measuring the thermoelectronic emission constants of electrodes in cesium vapor diodes are discussed. The first technique is based on the conclusion, drawn from work of V.P.Karmazin, I.I.Kazikov and I.P.Stakhanov (Izv. AN SSSR,Ser.fiz.28,1541,1964 - Abstract Acc.Nr:AP4045318) that under conditions of thermodynamic equilibrium the change in the anode potential of a cesium vapor diode carrying a constant current due to a change in the anode temperature is essentially equal to the change in the anode work function. By measuring the equilibrium current as a function of the anode potential for different anode temperatures one can

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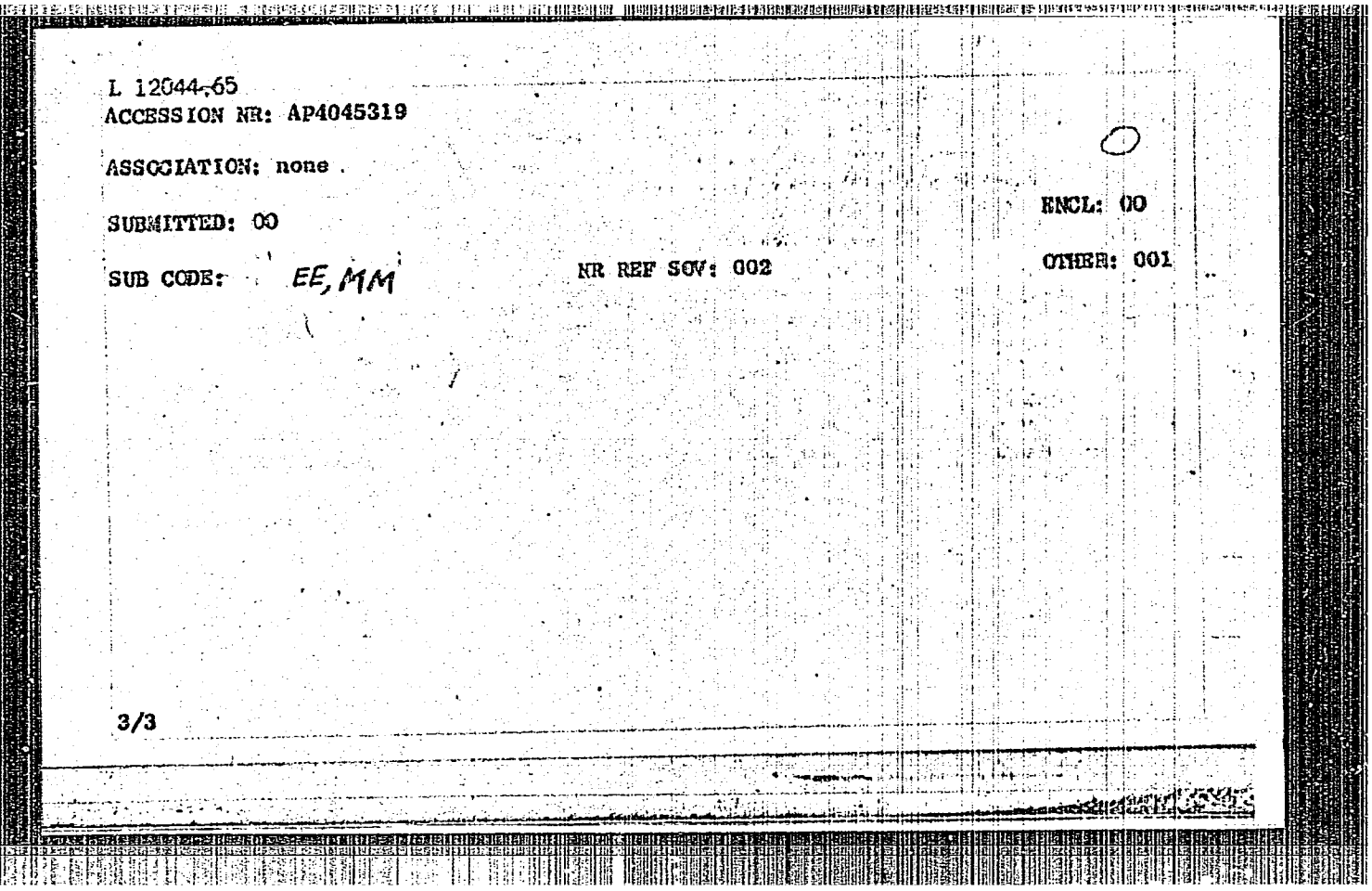
thus determine the variation of the anode work function with temperature. The zero point on the resulting curve can be located by means of the known work function of the thick cesium layer that forms on the electrode at low temperatures (about 400°C). The work functions in cesium vapor of niobium at 0.12 torr and molybdenum at 0.23 torr were measured in this way, and the results are presented graphically. The molybdenum work function exhibited a pronounced minimum of 1.7 eV at 730°K. The second procedure consists in determining the thermionic emission (Richardson) current I_R from the relation $I = I_S\sqrt{1 - I/I_R}$, where I_S is the equilibrium current and I is the current through the converter under conditions of overcompensation. Results of such measurements of the emission current of molybdenum are presented. They are considered to be in satisfactory agreement with the measurements of R.L.Aamodt (J.Appl. Phys.33,2080,1962). It is concluded that the proposed procedures can be employed to measure the thermoelectronic emission constants of metal film cathodes in cesium vapor atmospheres of relatively high pressure, and that by a combination of the two techniques both the work function and the Richardson constant can be determined. "In conclusion, the authors express their deep gratitude to the late Prof.I.I.Borodarenko for valuable discussions." Orig.art.has: 4 formulas and 3 figures.



L 12044-65
ACCESSION NR: AP4045319

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: EE, MM

NR REF SOV: 002

OTHER: 001

3/3

S/0057/64/034/006/1105/1106

ACCESSION NR: AP4040317

AUTHOR: Gus'kov,Yu.K.; Pashchenko,V.P.; Stakhanov,I.P.; Stumbur,E.A.

TITLE: Effect of Coulomb scattering on the operation of thermo-electronic converters

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 1105-1106

TOPIC TAGS: Coulomb scattering, electron collision, diode, cathode, cesium, thermoelectronic converter

ABSTRACT: The electron collision frequencies obtained from the dependence of the current on the transverse magnetic field in cesium vapor thermal emission converters greatly exceed the corresponding frequencies of collision between electrons and cesium atoms. The possibility is discussed of ascribing this discrepancy to the effect of Coulomb collisions of the electrons with electrons and ions. Experimental collision frequencies in cesium vapor diodes are plotted against pressure and compared with the calculated Coulomb collision frequencies. The theoretical curve lies somewhat above the experimental points. To account for this slight discrepancy several possibilities are adduced, including the inexactness of the concept of collision

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ACCESSION NR: AP4040317

when applied to the case of Coulomb interaction. A cylindrical hot cathode cesium diode with 1 mm electrode spacing was operated at pressures from 0.055 to 0.24 tor. The behavior of the diode indicated diffusive conditions even at the lowest pressure where the mean free path due to collisions with cesium atoms was 1.5 mm (greater than the electrode spacing), and the Coulomb mean free path was 0.1 mm (much less than the electrode spacing). Orig.art.has: 3 formulas and 2 figures.

ASSOCIATION: none

SUBMITTED: 10Jun63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: ME,NP NR REF SOV: 005 OTHER: 001

Card 2/2

L 14389-65 EWT(1)/EWP(e)/EWG(k)/EWT(m)/EPA(sp)-2/EPF(n)-2/EPA(w)-2/T/
EWP(t)/EWP(k)/EWA/EWP(b) Pz-6/Pab-10/Pf-4/Pu-4 IJP(c)/AFWL/SSD/ASD(p)-3
JD/AT
ACCESSION NR: AP4042934 S/0057/64/034/008/1451/1461

AUTHOR: Gus'kov, Yu. K.; Lebedev, M. A.; Stakhanov, I. F.

TITLE: Low-voltage arc in cesium vapors

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 34, no. 8, 1964, 1451-1461

TOPIC TAGS: arc discharge, cesium vapor, glow discharge, cathode physics

ABSTRACT: Low-voltage arc discharge in cesium vapors was investigated in view of the possible practical applications of this phenomenon, particularly in thermionic energy converters. The experiments were performed with two specially constructed discharge chambers with plane electrodes; the interelectrode spacing was 6 mm in one chamber and 10 mm in the other. In one series of experiments the dependence of V_b (breakdown potential) on Pd (P is the cesium vapor pressure in mm Hg and d is the interelectrode spacing) was established at various cathode temperatures from 500 to 800C and at anode temperatures either kept constant at 800C or varying from 500 to 800C. In another series of experiments the potential differences occurring on the electrodes after the sparking of the discharge were plotted with the minimal glow potentials. Further measurements included the dependence of the

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ACCESSION NR: AP4042934

discharge current on Pd. Volt-ampere characteristics were plotted for various temperatures and for Pd values of 0.68, 2.75 and 3.0. The potential distribution, electron temperatures, and plasma densities were investigated by the probe method. The experiments showed that the glow discharge occurs at T_{cath} < 600C and the arc discharge, at T_{cath} > 600C. In the first case the ionization takes place in the direct vicinity of the cathode, while in the second case the emission increases rapidly and thermal ionization becomes possible. It is stated that additional experiments will be needed to determine the character of changes in electron temperatures and work functions taking place near the cathode. The authors thank Professor I. I. Bondarenko (Deceased) for his interesting discussions. Orig. art. has: 10 figures, 1 table, and 15 formulas.

ASSOCIATION: none

SUBMITTED: 10Jun63 ENCL: 00 SUB CODE: EM

NO REF SOV: 002 OTHER: 003

Card 2/2

L 26969-65 EWT(l)/EWT(m)/EPA(s)-2/EPF(n)-2/EWP(t)/EEC(t)/EPA(w)-2/EPA(bb)-2/EWA(m)-2/EWP(b) Pab-10/Pt-10/Pu-4 IJP(c) JD/WW/JG S/0057/65/035/001/0156/0157

ACCESSION NR: AP5003253

AUTHOR: Gus'kov, Yu.K./ Lebedev, S.Ya./ Rodionova, V.G.

TITLE: Electric breakdown through a slot in glass in a cesium vapor atmosphere

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 156-157

TOPIC TAGS: cesium, dielectric breakdown, dielectric strength

ABSTRACT: The breakdown potential between a 1.1 cm diameter hot cylindrical cathode and a 1.8 cm diameter coaxial cylindrical anode was measured in cesium vapor at pressures from 0.001 to 3 mm Hg and at cathode temperatures from 430 to 650°C. In the interelectrode space was located a glass cylinder [diameter and wall thickness not given] coaxial with the electrodes and containing a circular slot of adjustable width; the plane of the slot was perpendicular to the axis of the system. The width of this slot was varied from 0.03 to 0.3 mm. The results are tabulated. The breakdown potential decreased somewhat with increasing slot width, and as a function of pressure it was minimum at about 0.1 mm Hg. "In conclusion, the authors thank Yu.Ya.Stavisskiy for valuable discussions and Ye.S.Afon'kin for assistance with the work." Orig.art.has: 3 figures and 1 table.

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ACCESSION NR: AP5003253

ASSOCIATION: none

SUBMITTED: 30Jun64 ENCL: 00 SUB CODE: EM

NR REF SOV: 000 OTHER: 000

Card 2/2

L 49243-65 EWT(1)/EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pt-7/Pu-4 IJP(c)

JD/WW/JG
ACCESSION NR: AP5010814 UR/0057/65/035/004/0751/0758

AUTHOR: Bondarenko, I.I.; Gus'kov, Yu.K.; Lebedev, M.A.

TITLE: Investigation of the influence of a transverse magnetic field on a low-voltage cesium vapor arc

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 4, 1965, 751-758

TOPIC TAGS: cesium vapor diode, transverse magnetic field

ABSTRACT: The authors have investigated the effect of a transverse magnetic field (up to 370 Oe) on the operation of low-voltage cesium vapor arc between hot stainless steel electrodes. The electrodes were hollow cylinders 18 mm in diameter and their closed ends were separated by 6 mm. The electrodes were heated by internal nichrome heaters and the temperatures of the ends were measured with thermocouples. In most of the experiments the cathode temperature was 800°C and the anode temperature was 350°C. The tubes were baked out on the pumps and sealed off at 1-2 x 10^{-7} mm Hg. A tube was discarded when its ignition and burning potentials began to increase. The cesium vapor pressure was controlled by heating a branch tube containing cesium. The magnetic field was produced by two 14 cm

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ACCESSION NR: AP5010814

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diameter coils separated by 14 cm. The ignition potential and the current-voltage characteristics were determined as functions of the cesium vapot pressure and magnetic field strength; the results are presented graphically and discussed at some length. For cesium pressures above the critical value good agreement was found with the theory of R.Haefer (Acta Physica Austriaca, 7, No. 1, 52, 1953) when the ionization energy of cesium was assumed to be 1.35 eV, which is close to the excitation energy of an excited cesium atom. This agreement is regarded as further evidence that ionization of cesium in the low-voltage arc proceeds in a stepwise manner. Significant deviations from the theory were observed at low pressures. "In conclusion, the authors express their gratitude to Academician A.I.Leypunskiy of the Ukrainian SSR Academy of Sciences, V.P.Pashchenko, I.P.Stakhanov, and A.S. Stepanov for discussions." Orig. art. has: 8 formulas and 10 figures.

ASSOCIATION: None

SUBMITTED: 06Jun64 ENCL: 00 SUB CODE: EC

NR REF SOV: 005 OTHER: 001

Card 2/2

L 4981-66 EWT(d)/EWT(l)/EWT(m)/EPF(c)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2/T/EWP(t)/EWP(b)/
ACC NR: AP5024056 EIC(m) IJP(c) SOURCE CODE: UR/0057/65/035/009/1707/1709
JD/WW/JG/AT

AUTHOR: Bekmukhambetov, Ye. S.; Gus'kov, Yu. K.; Lebedev, S. Ya.

ORG: none

TITLE: The influence of krypton on the operation of a thermionic converter

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1707-1709

TOPIC TAGS: thermionic energy converter, cesium, krypton

ABSTRACT: The short-circuit currents and volt-ampere characteristics of a thermionic converter were determined in the presence of pure cesium at pressures of 0.31—235 mm Hg and then with various additions of krypton. The molybdenum emitter was kept at temperatures below 600C, and its distance from the niobium collector was about 0.15 mm. The measurements showed a parallel shift of current-temperature curves toward lower currents when krypton pressures were increased. The volt-ampere characteristics indicated that small admixtures of krypton bring about a small increase of the voltage; when krypton pressure is increased, the converter's output drops. A comparison of the experimentally obtained values for current with those calculated by the use of

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L 4981-65

ACC NR: AP5024056

the diffusion theory showed the former to be 2—3 times lower than the latter. This can be attributed to insufficiently accurate values of the electron scattering cross sections of krypton atoms, or to a thermodiffusion process involving the elimination of Cs from the interelectrode gap. Orig. art. has: 1 formula and 4 figures. [ZL]

SUB CODE: EC,NP/ SUBM DATE: 06Mar65/ ORIG REF: 001/ OTH REF: 001

ATD PRESS: 4131

OC

Card 2/2

L 23703-66 EWT(l)/EWT(m)/EWP(t) IJP(c) JD/JG

ACC NR: AT6006754 SOURCE CODE: UR/3158/65/000/015/0001/0018

AUTHOR: Bekmukhambetov, Ye. S.; Gus'kov, Yu. K.; Kasikov, I. I.; Lebedev, S. Ya.; Rodin, A. V.; Stakhanov, I. P.

ORG: Physics and Power Institute, State Committee on the Use of Atomic Energy, SSSR (Fiziko-energeticheskiy institut, Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii SSSR)

TITLE: Operation of a cesium diode with inert-gas impurity

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 15, 1965. Rabota tseziyevogo dioda s primes'yu inertnogo gaza, 1-18

TOPIC TAGS: cesium electron tube, cesium plasma, thermoelectric convertor, volt ampere characteristic, pressure effect, temperature dependence, inert gas

ABSTRACT: The investigations were motivated by the fact that when a thermoelectric converter is operated in a nuclear reactor, the fission products, a large fraction of which are radioactive krypton and xenon, may enter in the interelectrode gap of the converter, and their effect on the converter in the operation of a cesium diode may be appreciable. The tests were made with experimental tubes with flat electrodes, using a molybdenum cathode and niobium anodes. Doubly distilled metallic cesium and spectrally pure krypton and xenon were used in varying amounts. The cathode was fed with pulsating halfwave current. The cesium vapor pressure ranged from 0.1 to 3.9 mm Hg for the krypton-filled tube and 0.028 to 2 mm Hg for the xenon-filled tube. Plots were prepared of the dependence of the short-circuit current on

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ACC NR: AT 6006754

the cathode temperature without and with the inert gases, and volt-ampere characteristics at various pressures. The introduction of the inert gases resulted in a parallel shift of the temperature dependence curves towards smaller currents, and to noticeable reduction in the output parameters of the converter. Comparison of the experimental results with calculations based on diffusion theory show in general good agreement, although some unexplained irregularities were observed in that the saturation current following addition of xenon was higher than following addition of krypton, and that the experimental currents usually were lower than the theoretical ones. These deviations are related to thermal diffusion separation of the cesium-krypton and cesium-xenon mixtures in the tube. The experiments show that addition of inert gases reduces the saturation current compared with pure cesium. The experimental saturation currents were as a rule lower than the theoretical ones by a factor 2--4. Addition of krypton reduced the saturation current more than addition of xenon. The thermal diffusion ratios were calculated for Cs-Kr and Cs-Xe mixtures in the case of low cesium densities. The values obtained for the cross sections of the interaction between cesium and xenon and krypton are 1.05×10^{-13} and 8×10^{-14} cm^2, respectively. Direct experiments on the thermal diffusion in the mixtures of cesium and inert gases are necessary for a final interpretation of the results. Orig. art. has: 12 figures and 12 formulas.

SUB CODE: 20/ ORIG REF: 004/ OTH REF: 002

SUBM DATE: none

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L 24322-66 EWT(1)/EWT(m)/EPF(n)-2/EWG(m)/T/EWP(t) IJP(c) JD/JG/AT

ACC NR: AT6006755 SOURCE CODE: UR/3158/65/000/016/0001/0010

AUTHOR: Volkov, N. V.; Gus'kov, Yu. K.; Zyukov, V. I.; Pashchenko, V. P.

ORG: Physics and Power Institute, State Committee on the Use of Atomic Energy, SSSR (Fiziko-energeticheskiy institut, Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii SSSR)

TITLE: Effect of size of interelectrode gap on the operation of cesium thermionic converter

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 16, 1965. Vliyaniye velichiny mezhelektrodnogo zazora na rabotu tseziyevogo termopreobrazovatelya, 1-10

TOPIC TAGS: cesium electron tube, cesium plasma, thermoelectric convertor, volt ampere characteristic, gas kinetcs, pressure effect, impact ionization

ABSTRACT: The authors have measured the dependence of the short-circuit current, the discharge ignition voltage, the output voltage, and the thermionic-converter power, when operating in the arc discharge mode at a constant cesium pressure. Earlier investigations of the effect of the interelectrode gap were made usually at optimal cesium pressure and optimum anode temperature, and did not yield sufficient data to explain the role and character of the physical processes responsible for the optimal conditions. The measurements were made with a tube having a movable anode. The molybdenum cathode was heated with an electron gun, and the gap could be

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ACC NR: AT6006755

varied from 0.2 to 8 mm. The anode was stainless steel and its temperature was controlled by air cooling. The volt-ampere characteristics were taken both with an oscilloscope and with a pointer-type meter. The experimental plots of the saturation curve against the gap length (L) and of the output power were compared with calculations based on the kinetic theory. The tests show that the dependence of the short-circuit current on the gap and on the pressure is characterized by the presence of a maximum, confirming earlier results. An increase in the temperature of the cathode improves the ignition and combustion conditions for the arc, for both larger and smaller gaps. The output power of the converter has a stronger dependence on the gap than the short-circuit current, but in the region of $L/\lambda = 5$--25 ($\lambda =$ electron mean free path) the power likewise changes little. A distinction is made between two types of operation -- without volume ionization ($\lambda/L \approx 1$), and the arc mode (L/λ much larger). The theoretical and experimental results are compared for both modes. Orig. art. has: 7 figures and 4 formulas.

SUB CODE: 10,20/ 1 ORIG REF: 009/ OTH REF: 007

SUBM DATE: none

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L 27476-66 EWT(1) IJP(c) AT SOURCE CODE: UR/3158/65/000/018/0001/0008

ACC NR: AT6008419

AUTHOR: Gus'kov, Yu. K.; Kiryushchenko, A. I.; Lebedev, M. A.; Morozova, G. G.

ORG: None

TITLE: Measurement of electron temperature in a cesium low voltage arc (Brief report)

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 18, 1965. Izmereniye elektronnoy temperatury v tseziyevoy nizkovol'tnoy duge, 2-8

TOPIC TAGS: cesium plasma, arc discharge, electron temperature, recombination radiation

ABSTRACT: The authors present preliminary results of the measurements of the electron temperature in a low voltage arc in cesium vapor with zinc impurity taken over the recombination continuum. The measurements were made in a discharge chamber with the electrodes made of stainless steel of 18 mm diameter. The electrodes were indirectly heated. The gap was 6 mm. A detailed description of an analogous discharge chamber was published earlier (ZhTF v. 34, No. 8, 1451,

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1964). The measurements were made at low cesium vapor pressure (0.1-1 Torr). The corresponding zinc vapor pressure ranged from 10^{-5} to 5×10^{-4} Torr. The measurements were made in the 5D continuum with an ISP spectrograph, using a photographic recording and microphotometry technique. Measurements at 3.0 amp discharge current and cathode and anode temperatures 1100K and 800K respectively, with a cesium vapor pressure 0.1 Torr show a maximum in the electron temperature (~4000K) at a distance of the order of the mean free path of the electron from the cathode (6×10^{-2} cm). The electron temperature then drops rapidly to about 2000K, but increases again near the anode. With increasing pressure the maximum shifts toward the cathode. A brief analysis shows that the electron temperature near the cathode can in fact not be uniequely defined, since there is no Maxwellian distribution. This is confirmed also by probe measurements. The rise in the temperature near the anode is attributed to measurement errors. In the rest of the gap the electron temperature is practically uniform and differs somewhat from probe measurements.
The authors thank I. P. Stakhanov and I. I. Kasikov for continuous interest in the work. Orig. art. has: 3 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 004/ OTH REF: 001

L 35870-66 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) AT/JD

ACC NR: AP6021220 SOURCE CODE: UR/0294/66/004/003/0454/0456

AUTHOR: Bekmukhambetov, Ye. S. (Moscow); Gus'kov, Yu. K. (Moscow); Lebedev, S. Ya. (Moscow)

ORG: none

TITLE: The performance of a thermionic converter in a cesium-neon mixture.

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 3, 1966, 454-456

TOPIC TAGS: thermionic emission, thermionic energy conversion, volt ampere characteristic, cesium, cesium compound, thermionic converter, neon

ABSTRACT: The authors present the results of an investigation into the influence of a cesium-neon mixture on the performance of a thermionic converter. The measurements were made on an experimental lamp with plane electrodes. The dependence of the short-circuit current (I) on the cathode temperature was established together with the volt-ampere characteristics at different temperatures of the cathode in pure cesium vapors. Analogous series of measurements were made at different additions of neon. Two graphs presented show the curves I as a function of cathode temperature at cesium vapor pressures of $2.8 \cdot 10^{-1}$ and 2 mm Hg, and with neon pressure from 0.27 to 39 mm Hg. The graphs show that the experimental value of I for pure cesium in a diffusion-equilibrium region agrees satisfactorily with the calculations

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output parameters of the converter at p(Cs) = 2 mm Hg and cathode temperature of 1900K without neon and in a cesium-neon mixture when the value of the current through the converter exceeded $4 \cdot 10^{-1}$ a/cm^2. At low cesium vapor pressures (about $2.8 \cdot 10^{-1}$ mm Hg) additions of neon lead only to a decrease in the saturation current. In the region of high cesium vapor pressures (about 2 mm Hg), small additions of neon shift the volt-ampere characteristics toward large output voltages. When the neon pressures are close to and higher than the cesium pressures, the volt-ampere characteristics shift into the region of small output voltages; the output power drops as a result of the decrease in the current and the voltage. Similar results have been obtained for other inert gases elsewhere (Ye. S. Bekmukhambetov, Yu. K. Gus'kov. S. Ya. Lebedev. Zh. tekhn. fiziki, 35, No. 9, 1707, 1965). Orig. art. has: 5 figures, 1 formula, and 1 table. [26]

SUB CODE: 10/ SUBM DATE: 06Aug65/ ORIG REF: 002/ ATD PRESS: 5136

L 28479-66 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) AT/JD

ACC NR: AP6013134 SOURCE CODE: UR/0057/66/036/004/0753/0755

AUTHOR: Gushkov, Yu.K.; Kiryushchenko, A.I.; Lebedev, M.A.; Morozova, G.A.

ORG: none

TITLE: Measurement of the electron temperature in a low-voltage cesium arc

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 753-755

TOPIC TAGS: arc discharge, cesium, zinc, electron temperature, spectrometry

ABSTRACT: The authors have determined electron temperatures in 3A low-voltage arcs burning in a mixture of cesium and zinc vapors in the 6 mm gap between 18 mm diameter hot stainless steel electrodes, by measuring the intensity of the 5D recombination continuum. The cesium pressure was varied from 0.1 to 1 mm Hg and the zinc pressure from 10^{-5} to 5×10^{-4} mm Hg by adjusting the temperature of a side tube containing the metals. The cathode and anode temperatures were 1100 and 800 °K, respectively. The arc could be imaged on the spectrometer slit with the latter either parallel or perpendicular to the axis of the arc. A field of view stop assured a linear resolution of 0.2 mm. In the low pressure (0.1 mm Hg) arc the electron temperature was maximum (4000°K) at a distance from the cathode of the order of an electron free path (0.6 mm), dropped rapidly to about 2000 °K, and rose somewhat near the anode. As the pressure was increased the position of the electron temperature maximum shifted closer to the cathode, and in the highest pressure arc the temperature was constant at about

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ACC NR: AP6013134

2000 °K over the full length of the gap. The temperature rise observed near the anode is ascribed to experimental error due to the low intensity of the recombination radiation from this region. The electron velocity distribution could not be; Maxwellian at the location of the observed temperature maximum near the cathode, and the concept of electron temperature becomes meaningless for this region. The electron temperature at 1.8 mm from the cathode in the 0.1 mm Hg arc decreased from 1850 °K on the axis of the arc to 1725 °K at 2 mm from the axis. The intensity of the recombination radiation at greater distances from the axis was too low for accurate measurement. The authors thank I.P.Stakhanov and I.I.Kasikov for their interest in the work. Orig. art. has: 2 formulas and 3 figures.

SUB CODE: 20 SUBM DATE: 21May65 ORIG.REF: 005 OTH REF: 001

L 45167-66 EWT(l)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI IJP(c) RTW/JD/TT/WW/JG/AT

ACC NR: AP6028622 SOURCE CODE: UR/0057/66/036/008/1475/1480

98

B

AUTHOR: Volkov,N.V.; Gus'kov,Yu.K.; Zyukov,V.I.; Pashchenko,V.P.

ORG: none

TITLE: Influence of the length of the interelectrode gap on the operation of a cesium thermoelectric converter

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 8, 1966, 1475-1480

TOPIC TAGS: thermionic energy conversion, cesium, electric arc, cesium plasma

ABSTRACT: The authors have investigated the effect of the interelectrode gap length on the behavior of cesium vapor discharges between an electron beam heated molybdenum cathode and an air cooled stainless steel anode. Both electrodes were 12 mm in diameter, and the gap between them was varied from 0.2 to 8 mm. The cesium vapor pressure was varied at least over the range from 0.2 to 2.0 mm Hg. Meters and an oscilloscope were employed to record the discharge currents and voltages. The results are interpreted in terms of the theory of S.A.Mayev (Dissertation, FTI AN SSSR, L., 1962) and S.A.Mayev and I.P.Stakhanov (Izv. AN SSSR, ser. fiz., No. 9, 1964). The shape of the current-voltage characteristic practically did not change with change of gap length and in the undercompensated regime the pressure for maximum power was virtually the same as that for maximum current. Considerable increase of the power output in the undercompensated regime can

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ACC NR: AP6028622

be obtained by increasing the pressure and decreasing the gap length so as to keep the latter approximately equal to the electron mean free path. In the arc regime the short circuit current was maximum for a certain gap length and decreased almost linearly with increase of the gap beyond the optimum value until the arc was quenched. Considerable hysteresis in the quenching and ignition gap lengths was observed. In the arc regime the power was maximum for a gap length between 5 and 25 times the electron mean free path and decreased with decrease of the gap below this value. When increasing the cesium pressure in order to increase the power output in the arc regime, one should decrease the gap length so as to keep the ratio of the gap length to the electron mean free path approximately constant. This is in agreement with the findings of C.C.Weeks, R.C.Dahleen, and I.E.Gingrich (Adv.Energy Conv., 2, 315, 1962) and S.Kitrilakis and G.N.Hatsopoulos (Adv.Energy Conv.,2, 583, 1962). Orig. art. has: [15]
5 formulas and 7 figures.

SUB CODE: 20 SUBM DATE: 21Jun65 ORIG. REF: 009 OTH REF: 007
ATD PRESS: 5081

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L 45166-66 EWT)1)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI IJP(c) RTW/TT/JD/WW/JG/AT
ACC NR: AP6028623 SOURCE CODE: UR/0057/66/036/008/1481/1488

AUTHOR: Bekmukhambetov,Ye.S.; Gus'kov,Yu.K.; Kasikov,I.I.; Lebedev,S.Ya.; Stakhanov, I. P.; Rodin, A. V.

ORG: none

TITLE: Operation of a cesium thermoelectric converter in the presence of an inert gas

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 8, 1966, 1481-1488

TOPIC TAGS: thermionic energy conversion, cesium, electric arc, cesium plasma, inert gas, neon, argon, krypton, xenon

ABSTRACT: The authors have investigated the effect of the presence of Ne, Ar, Kr, and Xe on the operation of a cesium arc in the 0.5 to 1.0 mm gap between a hot molybdenum foil cathode and a niobium anode. The apparatus was sealed off at 10^{-7} mm Hg after having been cleansed by the usual vacuum techniques. The cesium pressure was controlled by varying the temperature of a branch tube containing metallic cesium, the temperature of the remainder of the apparatus being kept 30 to 50° C higher. The inert gas was admitted in successive doses by breaking tubes containing it. The cesium pressure was varied from 0.0275 to 3.9 mm Hg, and inert gas pressures up to 234 mm Hg were investigated. Very small additions of inert gas increased the plateau of the current-voltage characteristic by some 0.1 V, but further increase of the inert gas pressure led to deterioration of the characteristics of the converter.

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ACC NR: AP6028623

The presence of the inert gas decreased the saturation current. The saturation current under different conditions was calculated with the aid of the diffusion theory of B.Ya.Moyzhes and G.Ye.Pikus (FTT, 2, 756, 1960), and the results are compared with the measured values. The measured saturation currents were usually from 2 to 10 times lower than the calculated currents. This is ascribed to increase of the inert gas concentration in the hot region between the electrodes as a result of thermal diffusion of the inert gas cesium mixture. Zenon reduced the saturation current less than did neon or krypton; this is ascribed to the fact that the atomic mass of xenon is closer than that of neon or krypton to the atomic mass of cesium. A formula is derived for the thermal diffusion ratio, and with the aid of this formula and the assumption that the observed deviations from the moyzhes-Pikus theory are due to thermal diffusion, values of the Kr-Cs and Xe-Cs cross sections were calculated from the experimental data. The Kr-Cs and Xe-Cs cross sections were thus found to be 8×10^{-14} and 1.05×10^{-13} cm^2, respectively. The authors thank S.I.Kutashev and V.I.Klinov for assistance in constructing the apparatus and performing the measurements. Orig. art. has: 11 formulas, 6 figures and 3 tables. [15]

SUB CODE: 20 SUBM DATE: 23Aug65 ORIG. REF: 002 OTH REF: 004/
ATD PRESS: 5081

Card 2/2 aum

GUS'KOV, Yu.P. (Moskva)

Controlling method for rotating the plane of a satellite's circular orbit. Prikl. mat. i mekh. 27 no.3:578-582 My-Je '63. (MIRA 16:6)

(Artificial satellites--Controls)

L 03009-67 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)
ACC NR: AP6033206 SOURCE CODE: UR/0040/66/030/005/0908/0914

51
51
13

AUTHOR: Gus'kov, Yu. P. (Moscow)

ORG: none

TITLE: On optimal discrete correction of forced motions of stochastic systems

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 5, 1966, 908-914

TOPIC TAGS: automatic control, optimal control, optimal control synthesis, stochastic system, dynamic programming method, STOCHASTIC PROCESS

ABSTRACT: For the sampled-data control system described by the equations

$$\frac{dy}{dt} + A(t)y = B(t)f(t), \qquad f(t) = w(t) + q(t) \qquad (1)$$

where y is an n-dimensional vector of phase coordinates Y_i, A and B are given n x n and n x s matrices, w is an s-dimensional vector function of Markov type random disturbances, and q is a Δ-dimensional vector of discrete control responses q_k, the following problem is formulated: under the assumption that system (1) is completely controllable, phase coordinates Y_i can be measured, and a priori distribution of disturbances w_k is known, it is required to find the control $q = q(y)$ which will in a given time take system (1) from the initial state $y(t_i) = y^1$ to a certain state

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ACC NR: AP6033206

$y(t_{\nu+1}) = y^{\nu+1}$ and minimizes the mathematical expectation $\langle w(y^{\nu+1})\rangle$ of a certain positive definite function $w(y^{\nu+1})$. The formulated optimal control problem is thus close to the problem of analytic design of regulators in stochastic systems. It is shown that due to discrete control responses the control process of the final state can be represented in the form of a Markov chain. To determine the optimal control of system (1), the method of dynamic programming is applied under the assumption that the control response q_k belongs to a certain class of functions. Bellman's functional equations are derived in general form for the defined control process and their solution is sought for the problem of bringing system (1) to the origin of coordinates with optimal accuracy. The pattern of forming the sequence of optimal controls in a ν-step control process is presented and the minimal value of the optimality criterion is derived. Orig. art. has: 33 formulas.

SUB CODE: 12,12 / SUBM DATE: 28May65/ ORIG REF: 006/ ATD PRESS: 5099

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Card 2/2

GUS'KOVA,A.K.; BAYSOGOLOV,G.D.

[Two cases of acute radiation sickness in man] Dva sluchaia ostroi luchevoi bolezni u cheloveka; doklady, predstavlennye SSSR na Mezhdunarodnuiu konferentsiiu po mirnomu ispol'zovaniiu atomnoi energii. Moskva, 1955. 22 p. [Microfilm] (MLRA 9:3)
(Radiation--Toxicology)

GUS'KOVA, A.K.

Dynamics of the pathological process in the human nervous system subjected to the prolonged action of comparatively small doses of radiation. Khim. med. 38 no.5:20-26 My '60. (MIRA 13:12)
(NERVOUS SYSTEM) (RADIATION--PHYSIOLOGICAL EFFECT)

BAYSOGOLOV, G. D.; GUS'KOVA, A. K. (Moskva)

Two additional cases of acute radiation sickness in man. Klin. med. no.11:43-56 '61. (MIRA 14:12)

(RADIATION SICKNESS)

GUS'KOVA, A.K.; YURKOV, N.N.; KIRYUSHKIN, V.I. (Moskva)

Compensatory reactions in insufficiency of the brain's blood supply. Zhur.nevr.i piskh. 61 no.10:1457-1462 '61.
(MIRA 15:11)

(CEREBROVASCULAR DISEASES) (ELECTROENCEPHALOGRAPHY)

GLAZUNOV, I.S.; GUS'KOVA, A.K.; LIVANOV, M.N.

Basic regularities in the nervous system's reaction in acute radiation sickness (survey of the literature). Zhur.nevr.i psikh. 61 no.10:1574-1578 '61. (MIRA 15:11)
(RADIATION SICKNESS) (NERVOUS SYSTEM--RADIOGRAPHY)

GUSKOVA, A.K.

Basic principles in the diagnosis of chronic radiation sickness. Med.rad. no.3:77-85 '62. (MIRA 15:3)
(RADIATION SICKNESS)

GUS'KOVA, A.K.

Basic principles of dispensary services for persons working with sources of ionizing radiation and of scientific analysis of results of medical observations. Med. rad. 8 no.1:3-9 N '63. (MIRA 17:12)

1. Iz radiologicheskogo otdeleniya kliniki Instituta gigiyeny truda i professional'nykh zabolevaniy (direktor - deystvitel'nyy chlen AMN SSSR prof. A.A. Letavet) AMN SSSR.

BAYSOGOLOV, G.D.; GUS'KOVA, A.K.

Classification of radiation sickness. Med. rad. 9 no.2: 100-103 F '64. (MIRA 17:9)

GUS'KOVA, A.K.; DRUTMAN, R.D.; MALYSHEVA, M.S.; SOLDATOVA, V.A.

Determination of the dosis and the possibility of clinical diagnosis of disease caused by exposure to Po^{210}. Med. rad. 9 no.8:51-60 Ag '64. (MIRA 18:4)

1. Radiologicheskoye otdeleniya kliniki Instituta gigiyeny truda i professional'nykh zabolevaniy (dir. - deystvitel'nyy chlen AMN SSSR prof. A.A.Letavet) AMN SSSR.